Jawapan

Bab 7

1. Jarak *AB* = Jarak mencancang
Distance of AB = Vertical distance

= 5 − 2

= 3 unit/ *units*

Jarak *CB* = Jarak mengufuk
Distance of CB = Horizontal distance

= 6 − 2

= 4 unit/ *units*

Gunakan teorem Pythagoras untuk mencari jarak *AC*
Use Pythagoras theorem to find the distance of AC

$AC = \sqrt{AB^2 + BC^2}$

$= \sqrt{3^2 + 4^2}$

$= \sqrt{25}$

= 5 unit/ *units*

2. (a) Jarak *GH* / *Distance of GH*
= 4 − (−1)
= 5 unit / *units*

(b) Jarak *IJ* / *Distance of IJ*
= − 3 − (−12)
= 9 unit / *units*

(c) Jarak *KL* / *Distance of KL*
= − 2 − (−10)
= 8 unit / *units*

(d) Jarak *MN* / *Distance of MN*
= 4 − (−4)
= 8 unit / *units*

3. Jarak mengufuk, *BC* / *Horizontal distance*, $BC = x_2 - x_1$
Jarak mencancang, *AC* / *Vertical distance*, $AC = y_2 - y_1$
Menggunakan teorem Pythagoras
Using the Pythagoras theorem,

$AB^2 = BC^2 + AC^2$

$= (x_2 - x_1)^2 + (y_2 - y_1)^2$

$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

4. Contoh:

(i) Jarak *RS*/ *Distance of RS*
$= \sqrt{(12 - 6)^2 + (12 - 4)^2}$
$= \sqrt{36 + 64}$
$= \sqrt{100}$ = 10 unit / *units*

(ii) Jarak *RS*/ *Distance of RS*
$= \sqrt{(17 - 12)^2 + (22 - 10)^2}$
$= \sqrt{25 + 144}$
$= \sqrt{169}$
= 13 unit / *units*

(a) Jarak *RS*/ *Distance of RS*
$= \sqrt{[8 - (-16)]^2 + (-2 - 5)^2}$
$= \sqrt{576 + 49}$
$= \sqrt{625}$
= 25 unit / *units*

(b) Jarak *RS*/ *Distance of RS*
$= \sqrt{[15 - (-5)]^2 + [5 - (-5)]^2}$
$= \sqrt{400 + 100}$
$= \sqrt{500}$
= 22.36 unit / *units*

(c) Jarak *RS*/ *Distance of RS*
$= \sqrt{[0 - (-21)]^2 + (20 - 0)^2}$
$= \sqrt{441 + 400}$
$= \sqrt{841}$
= 29 unit / *units*

(d) Jarak *RS*/ *Distance of RS*
$= \sqrt{[-4 - (-5)]^2 + (6 - 5)^2}$
$= \sqrt{1 + 1}$
$= \sqrt{2}$
= 1.41 unit / *units*

5. (a) (i) Tinggi *PQ* / *Height of PQ*
= 9 − 4
= 5 unit / *units*

$\text{Luas} = \frac{1}{2} \times \text{tapak} \times \text{tinggi}$

$\textit{Area} = \frac{1}{2} \times \textit{base} \times \textit{height}$

$30 = \frac{1}{2} \times PR \times 5$

PR = 12 unit / *units*

(ii) $x = 2 + 12$
$= 14$

Koordinat titik *R*
Coordinates of point R
= (14, 4)

(b) (i) Panjang *KN* / *Length of KN*
= 6 – 1
= 5 unit / *units*

Luas = panjang × lebar
Area = length × width
40 = *KL* × 5
KL = 8 unit / *units*

Koordinat titik *L*
Coordinates of point L
= (8, 6)

(ii) Pepenjuru / *Diagonal* = *LN*
$LN^2 = 5^2 + 8^2$
$= 89$
$LN = \sqrt{89}$
= 9.43 unit / *units*

(c) Menggunakan teorem Pythagoras,
Using the Pythagoras theorem,
$(p - 7)^2 + [8 - (-4)]^2 = 13^2$
$(p - 7)^2 + 12^2 = 13^2$
$(p - 7)^2 = 25$
$p - 7 = \pm\sqrt{25}$
$= \pm 5$

$p = +5 + 7$ $\quad$ $p = -5 + 7$
$= 12$ $\quad$ $= 2$

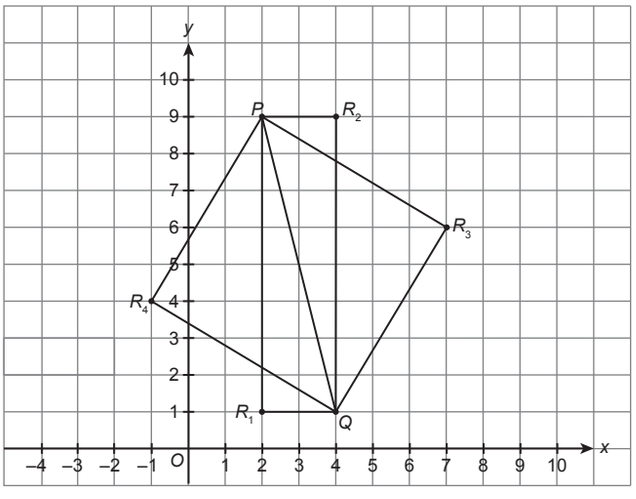
ALTERNATIF

KAEDAH

$p^2 - 14p + 49 = 25$
$p^2 - 14p + 24 = 0$
$(p - 12)(p - 2) = 0$

$p - 12 = 0$ $\quad$ $p - 2 = 0$
$p = 12$ $\quad$ $p = 2$

(d) Koordinat yang mungkin bagi *R* ialah (2, 1), (4, 9), (7, 6) dan (–1, 4).
The possible coordinates of R are (2, 1), (4, 9), (7, 6) *and* (–1, 4).



(e) Jarak titik *K* dan titik *L* / *Distance of point K and point L*

(i) $= \sqrt{(-2 - 3)^2 + (3 - 2)^2}$
$= \sqrt{26}$
= 5.1 unit/ *units*

(ii) Katakan koordinat *M* ialah(*x*, *y*) / *Let coordinates of M be* (*x*, *y*)
Jarak mengufuk garis *KL*= Jarak mengufuk garis *NM*
Horizontal distance of line KL = Horizontal distance of line NM

$\sqrt{(-2 - 3)^2} = \sqrt{(-1 - x)^2}$
$25 = (-1 - x)^2$
$25 = 1 + 2x + x^2$
$x^2 + 2x - 24 = 0$
$x = 4, x = -6$

Jarak mencancang garis *KL*= Jarak mencancang garis *NM*
Vertical distance of line KL = Vertical distance of line NM

$$\begin{aligned}\sqrt{(3-2)^2} &= \sqrt{(-2-y)^2}\\ 1 &= (-2-y)^2\\ 1 &= 4+4y+y^2\\ y^2+4y+3 &= 0\\ y &= -1, y=-3\end{aligned}$$

Oleh kerana garis *KL* adalah selari dengan garis *NM* dan *M* terletak pada sukuan IV, maka koordinat titik *M* ialah (4, –3).
Since line KL is parallel to the line NM and M lies in the quadrant IV, *thus the coordinates of point M are* (4, –3).

6. (a) (i) Titik tengah bagi garis *PU* = [*S*]
Midpoint of line PU

(ii) Titik tengah bagi garis *QS* = [*R*]
Midpoint of line QS

(iii) *Q* ialah titik tengah bagi garis = [*PS*]
Q is the midpoint of line

(b) (i) *BF* = [*D*]

(ii) *CG* = [*E*]

(iii) *AG* = [*D*]

7. $PS = MT$
$x - x_1 = x_2 - x$
$2x =$ [$x_1 + x_2$]
$x =$ [$\frac{x_1 + x_2}{2}$]

$MS = QT$
$y - y_1 = y_2 - y$
$2y =$ [$y_1 + y_2$]
$y =$ [$\frac{y_1 + y_2}{2}$]

Maka, koordinat titik tengah, *M*
Thus, the coordinates of the midpoint, M
= [$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$]

8. (a) Titik tengah / *Midpoint* = $\left(3, \frac{5}{2}\right)$

(b) Titik tengah / *Midpoint* = (–1, 1)

9. (a) Titik tengah *RS*/ *Midpoint of RS*
$= \left(\frac{-2+6}{2}, \frac{-2+4}{2}\right) = (2, 1)$

(b) Titik tengah *AB*/ *Midpoint of AB*
$= \left(\frac{1+7}{2}, \frac{-5+3}{2}\right) = (4, -1)$

(c) Titik tengah *KL*/ *Midpoint of KL*
$= \left(\frac{-20+5}{2}, \frac{12+(-6)}{2}\right)$
$= \left(-\frac{15}{2}, 3\right)$

(d) Titik tengah *EF*/ *Midpoint of EF*
$= \left(\frac{-4+0}{2}, \frac{9+7}{2}\right)$
$= (-2, 8)$

(e) Titik tengah *MN*/ *Midpoint of MN*
$= \left(\frac{2+8}{2}, \frac{-1+1}{2}\right)$
$= (5, 0)$

(f) Titik tengah / *Midpoint*
$= \left(\frac{-5+7}{2}, \frac{4+(-12)}{2}\right)$
$= (1, -4)$

(g) Titik tengah / *Midpoint*
$= \left(\frac{-2+(-8)}{2}, \frac{3+(-5)}{2}\right)$
$= (-5, -1)$

10. (a) Katakan/ *Let* $P = (x, y)$,
$\left(\frac{x+3}{2}, \frac{y+5}{2}\right) = (-1, 3)$

$\frac{x+3}{2} = -1$
$x + 3 = -2$
$x = -5$

$\frac{y+5}{2} = 3$
$y + 5 = 6$
$y = 1$
$\therefore P = (-5, 1)$

Titik *Q* ialah titik tengah *PR*.
Point Q is the midpoint of PR.
$Q = \left(\frac{-5+(-1)}{2}, \frac{1+3}{2}\right)$
$= (-3, 2)$

(b) Katakan koordinat-*y* yang telah dipadam ialah *y*.
Let the y-coordinate that has been deleted be y.

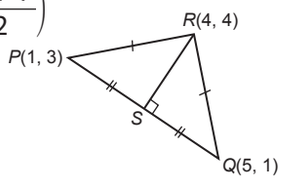
$$\frac{-2+y}{2} = -4$$
$$-2 + y = -8$$
$$y = -6$$

Daripada pengiraan diketahui
From the calculation, it is known that
$x_1 = 4, x_2 = 8$

Dua kemungkinan pasangan titik bagi garis lurus
Two possibilities for the pairs of points of the straight line
(4, –2) dan/ *and* (8, –6);
(4, –6) dan/ *and* (8, –2).

(c) (i) S = Titik tengah garis PQ
Midpoint of line PQ

$$= \left(\frac{1+5}{2}, \frac{3+1}{2}\right)$$
$$= (3, 2)$$



(ii) S ialah titik tengah pepenjuru RT.
S is the midpoint of diagonal RT.

Katakan / *Let* $T(x, y)$.

$$\frac{x+4}{2} = 3 \qquad \frac{y+4}{2} = 2$$
$$x + 4 = 6 \qquad y + 4 = 4$$
$$x = 6 - 4 \qquad y = 4 - 4$$
$$= 2 \qquad = 0$$

∴ Koordinat titik T / *Coordinates of point T*
$= (2, 0)$

11. (a) (i) Panjang pagar dawai
The length of the wire fence

$$= \sqrt{[-23 - (-17)]^2 + (32 - 20)^2}$$
$$= \sqrt{180}$$
$$= 13.42 \text{ units/ } units$$
$$= (13.42 \times 1.2) \text{ km}$$
$$= 16.10 \text{ km}$$

(ii) Koordinat tiang/ *Coordinates of the pillar*
= Titik tengah bagi ST/ *Midpoint of ST*

$$= \left(\frac{-23 + (-17)}{2}, \frac{32 + 20}{2}\right)$$
$$= (-20, 26)$$

(b) (i) $x - (-4) = 6$
$x + 4 = 6$
$x = 2$
∴ Koordinat R / *Coordinates of R* $= (2, 6)$

(ii) Koordinat Q ialah (2, –2).
The coordinates of Q are (2, –2).
Oleh itu, / *Therefore*,

$$QR = 6 - (-2)$$
$$= 8 \text{ km}$$
$$PQ = 2 - (-10)$$
$$= 12 \text{ km}$$
$$PS = \sqrt{[-4 - (-10)]^2 + [6 - (-2)]^2}$$
$$= 10 \text{ km}$$

Jarak laluan peserta lelaki
Distance of route of male participants
$= PQ + QR$
$= 12 + 8 = 20$ km

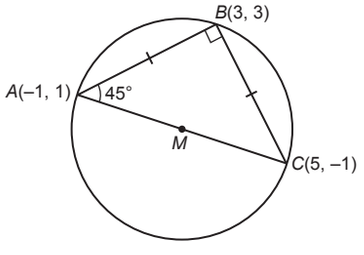
Jarak laluan peserta perempuan
Distance of route of female participants
$= PS + SR$
$= 10 + 6 = 16$ km

Beza jarak / *Difference of distance*
$= 20 - 16 = 4$ km

(c) (i) Titik M ialah titik tengah bagi garis AC.
Point M is the midpoint of line AC.

$$M = \left(\frac{-1+5}{2}, \frac{1+(-1)}{2}\right)$$
$$= (2, 0)$$

(ii) Jejari bulatan ialah panjang bagi BM, AM dan CM.
Radius of the circle is the length of BM, AM and CM.



$$BM = \sqrt{(3-2)^2 + (3-0)^2}$$
$$= \sqrt{1^2 + 3^2}$$
$$= \sqrt{1 + 9}$$
$$= \sqrt{10}$$
$$= 3.16 \text{ unit / } units$$

(iii) M ialah titik tengah antara titik B dengan titik D.
M is the midpoint between point B and point D.

Katakan / *Let* $D(x, y)$

$$\frac{x+3}{2} = 2 \qquad \frac{y+3}{2} = 0$$
$$x + 3 = 4 \qquad y + 3 = 0$$
$$x = 4 - 3 \qquad y = -3$$
$$= 1$$

Maka, koordinat lampu isyarat D ialah (1, –3).
Thus, the coordinates of traffic light D is (1, –3).

(iv) Lilitan bulatan
Circumference of the roundabout
$= 2\pi j \times 2.5$
$= 2 \times \frac{22}{7} \times 3.16 \times 2.5$
$= 19.86 \times 2.5$
$= 49.66$ m

Praktis Masteri 7

BAHAGIAN A

1. Koordinat titik S / *Coordinates of point S*
$S = (2, 4 + 6)$
$= (2, 10)$
Jawapan / *Answer* : **D**

2. Koordinat titik S / *Coordinates of point S*
$S = \left(\frac{4+0}{2}, \frac{-3+(-9)}{2}\right)$
$= (2, -6)$
Jawapan / *Answer* : **A**

3. Jarak PQ / *Distance of PQ*
$= \sqrt{(7-5)^2 + (-2-3)^2}$
$= \sqrt{29}$ unit / *units*
Jawapan / *Answer* : **B**

4. $(2, 1) = \left(\frac{0+x}{2}, \frac{-1+y}{2}\right)$

$\frac{0+x}{2} = 2$ $\qquad$ $\frac{-1+y}{2} = 1$
$x = 4$ $\qquad$ $-1 + y = 2$
$y = 3$

Jawapan / *Answer* : **B**

BAHAGIAN B

5.

Titik *P* ***Point P***	**Titik *Q* (Titik tengah)** ***Point Q (Midpoint)***	**Titik *R*** ***Point R***
(2, 1)	(3, 4)	(4, 7)
(−1, 3)	(−3, 6)	(−5, 9)
(6, 8)	(1, 4)	(−4, 0)
(−7, −8)	(−8, −5)	(−9, −2)

Titik tengah antara titik $P(2, 1)$ dan titik $R(4,7)$
Midpoint between point P(2, 1) *and point R*(4, 7)
$= \left(\frac{2+4}{2}, \frac{1+7}{2}\right) = (3, 4)$

Titik tengah antara titik $P(-1, 3)$ dan titik $R(-5, 9)$
Midpoint between point P(−1, 3) *and point R*(−5, 9)
$= \left(\frac{-1+(-5)}{2}, \frac{3+9}{2}\right)$
$= (-3, 6)$

Koordinat titik R / *Coordinates of point R*
$(1, 4) = \left(\frac{6+x}{2}, \frac{8+y}{2}\right)$

$\frac{6+x}{2} = 1$ $\qquad$ $\frac{8+y}{2} = 4$
$6 + x = 2$ $\qquad$ $8 + y = 8$
$x = -4$ $\qquad$ $y = 0$
$\therefore R(-4, 0)$

Koordinat titik P / *Coordinates of point P*
$(-8, -5) = \left(\frac{x+(-9)}{2}, \frac{y+(-2)}{2}\right)$

$\frac{x+(-9)}{2} = -8$ $\qquad$ $\frac{y+(-2)}{2} = -5$
$x - 9 = -16$ $\qquad$ $y - 2 = -10$
$x = -7$ $\qquad$ $y = -8$

$\therefore P(-7, -8)$

6. (a) Jarak di antara (3, 5) dan (3, 9)
Distance between (3, 5) *and* (3, 9)
$= 9 - 5 = 4$ unit / *units*

Jarak di antara (2, −1) dan (2, 1)
Distance between (2, −1) *and* (2, 1)
$= 1 - (-1) = 2$ unit / *units*

Maka, (3, 5) dan (3, 9) mempunyai jarak yang lebih panjang.
Thus, (3, 5) *and* (3, 9) *have the longer distance.*

(b) Jarak di antara (3, −3) dan (−9, −3)
Distance between (3, −3) *and* (−9, −3)
$= 3 - (-9) = 12$ unit / *units*

Jarak di antara (−10, 7) dan (−17, 7)
Distance between (−10, 7) *and* (−17, 7)
$= -10 - (-17) = 7$ unit / *units*

Maka, (3, −3) dan (−9, −3) mempunyai jarak yang lebih panjang.
Thus, (3, −3) *and* (−9, −3) *have the longer distance.*

(c) Jarak di antara (13, 13) dan (10, 17)
Distance between (13, 13) *and* (10, 17)
$= \sqrt{(17-13)^2 + (10-13)^2}$
$= 5$ unit / *units*

Jarak di antara (−8, 0) dan (−2, −9)
Distance between (−8, 0) *and* (−2, −9)
$= \sqrt{(-9-0)^2 + [-2-(-8)]^2}$
$= 10.82$ unit / *units*

Maka, (−8, 0) dan (−2, −9) mempunyai jarak yang lebih panjang.
Thus, (−8, 0) *and* (−2, −9) *have the longer distance.*

(d) Jarak di antara (−18, 7) dan (−8, 19)
Distance between (−18, 7) *and* (−8, 19)
$= \sqrt{(19 - 7)^2 + [-8 - (-18)]^2}$
=15.62 unit / *units*

Jarak di antara (9, 9) dan (−5, −7)
Distance between (9, 9) *and* (−5, −7)
$= \sqrt{(-7 - 9)^2 + (-5 - 9)^2}$
= 21.26 unit / *units*

Maka, (9, 9) dan (−5, −7) mempunyai jarak yang lebih panjang.
Thus, (9, 9) *and* (−5, −7) *have the longer distance.*

BAHAGIAN C

7. (a) (i) Titik *N* terletak pada asalan. Maka, koordinat titik *N* ialah (0, 0).
Point N is located on the origin. Therefore, the coordinates of point N is (0,0).

(ii) $-8 = \frac{x + (-4)}{2}$ $\quad -2 = \frac{y + 2}{2}$
$x = -16 + 4$ $\quad y = -4 - 2$
$= -12$ $\quad = -6$

∴ Koordinat *P* ialah (−12, −6).
The coordinates of P is (−12, −6).

(iii) Panjang *PQ* / *Length of PQ*
$= \sqrt{[-4 - (-12)]^2 + [2 - (-6)]^2}$
$= \sqrt{128}$
= 11.31 unit / *units*

Panjang *QR* / *Length of QR*
$= \sqrt{[4 - (-4)]^2 + (-2 - 2)^2}$
$= \sqrt{80}$
= 8.94 unit / *units*

Beza panjang / *Difference in length*
= 11.31 − 8.94
= 2.37 unit / *units*

(b) (i) Panjang *BC* / *Length of BC*
$= \sqrt{(1 - 4)^2 + (2 - (-2))^2}$
$= \sqrt{25}$
= 5 unit / *units*

Perimeter / *Perimeter*
= 5 + 6 + 4 + 3
= 18 unit / *units*

Perimeter dalam m / *Perimeter in* m
= 18 × 2
= 36 m

(ii) Jumlah kos pembinaan pagar
Total cost of fence construction
= RM7.80 × 36
= RM280.80

∴ Maka pagar tidak dapat disiapkan kerana wang kurang RM0.80.
Thus, the fence could not be completed because the money was short by RM0.80.

Fokus KBAT

(a) Koordinat titik *C*
The coordinates of point C
$= \left(\frac{-30 + 50}{2}, \frac{20 + 60}{2}\right)$
= (10, 40)

(b) Jarak laluan murid perempuan
The distance of girl's route
$= \sqrt{(-30 - 50)^2 + (20 - 60)^2}$
$= \sqrt{6\,400 + 1\,600}$
$= \sqrt{8\,000}$
= 89.44 unit / *units*

Jarak laluan murid lelaki / *The distance of boy's route*
$= \sqrt{(50 - 30)^2 + (60 - 0)^2} + \sqrt{(30 - 10)^2 + (0 - 40)^2} + \frac{1}{2}(89.44)$
$= \sqrt{4\,000} + \sqrt{2\,000} + \frac{1}{2}(89.44)$
= 152.69 unit / *units*

Beza jarak / *Difference in distance*
= 152.69 − 89.44
= 63.25 unit / *units*